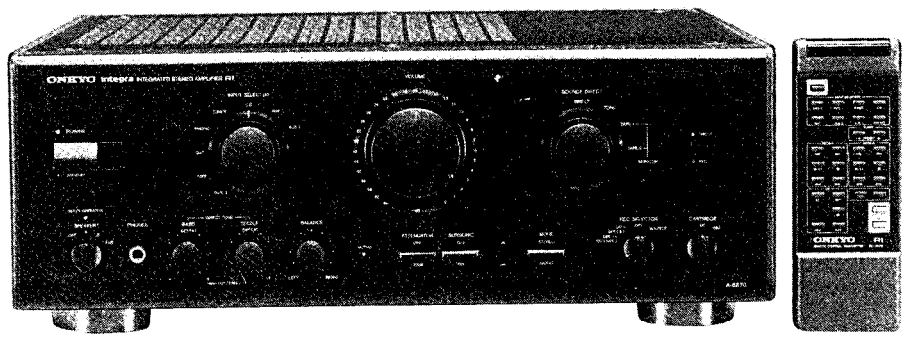
ONKY-00296

Ref. No. 3404

ONKYO® SERVICE MANUAL

A-8870

Integrated Stereo Amplifier
MODEL A-8870



Black and silver models

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.
MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Power Output:	105 watts per channel, min. RMS, at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.008% Total harmonic distortion.	
Dynamic Power:	303 watts at 2 ohms, 235 watts at 4 ohms 155 watts at 8 ohms	
Total Harmonic Distortion	0.008% at rated power 0.008% at 1 watt output	
Intermodulation Distortion:	0.005% at rated power	
Damping Factor:	150 at 8 ohms (1 kHz)	
Input Sensitivity/	Phono (MM):	2.5 mV/50 kohms
Impedance:	Phono (MC):	160 µV/130 ohms
	CD:	150 mV/30 kohms
	TUNER:	150 mV/30 kohms
	Tape Play:	150 mV/30 kohms
Output Level/Impedance:	Tape Rec:	150 mV/1.0 kohms (Phono)
Phono Overload:	Phono (MM):	200 mV RMS. at 1 kHz, 0.012% THD.
Tone Control		
(Vol −20 dB):	BASS:	±8 dB at 100 Hz
	TREBLE:	±8 dB at 10 kHz
High Cut:	6 kHz (6 dB/Octave) (TREBLE min.)	
Frequency Response:	CD, Tuner:	2 Hz−50 kHz (+0, −1 dB)
RIAA Deviation:	Phono (MM):	±0.3 dB, 20 Hz −20 kHz
Subsonic Filter:	20Hz (−3dB, 6dB/Oct)	
Signal to Noise	Phono (MM):	94 dB (5.0 mV input)
Ratio (IHF-A):	Phono (MC):	75 dB (0.5 mV input)
	CD (DIRECT):	107 dB
Attenuator:	−20 dB	
Muting:	−∞	
Power Supply:	European models:	AC230V, 50 Hz
Dimensions (W × H × D):	455 × 170 × 420 mm 17-15/16" × 6-11/16" × 16-9/16"	
Weight:	16.7 kg	

Specifications and features are subject to change without notice.

PRECAUTIONS

1. **Replacing the fuses**

   For continued protection against risk fire, replace only with same type and same rating fuse.

CIRCUIT NO.	PART NO.	DESCRIPTION
F901	252075	2.5A-SE-EAK, Primary fuse
F902	252077	4A-SE-EAK, Primary fuse

ADJUSTMENT PROCEDURES

Adjustments and Checking the Protection Circuitry

1. Preparations

1) Place the unit on the workbench. (There should be about 15 mm of space between the base plate of the unit and the work surface.)
2) Set up the unit as follows.
   (1) No load
   (2) No signal
   (3) Volume turned all the way down
   (4) Speaker switch OFF
   (5) Power switch OFF

Note) Check the following points before making adjustments
   (1) The power switch should be OFF.
   (2) The interior of the unit should not be warm.

2. Idling current adjustment

1) Turn the power switch ON and allow the unit to warm up for about 10 minutes.
   (1) Adjust R535 (R536) so that the voltage at test point VCT-IID on the NAAF-4209 circuit board is 15mV±5mV.
   Note) Semi-fixed resistors enclosed in parentheses ( ) are for the right channel.

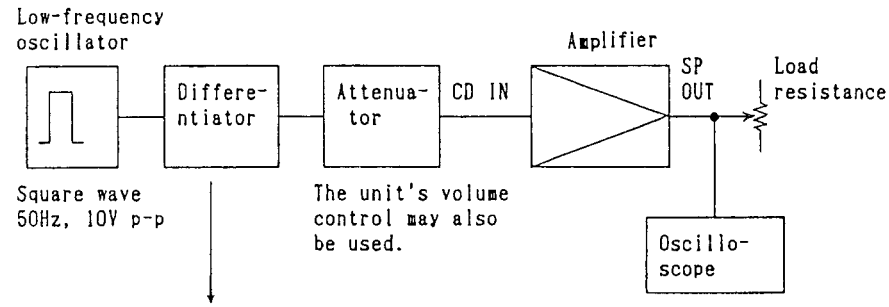
3. Check of operation of protection circuitry

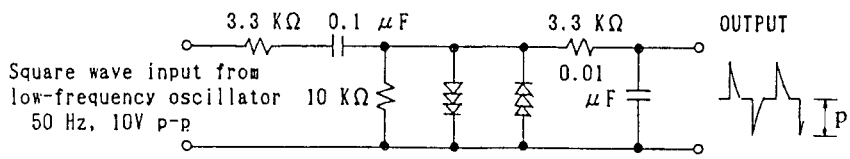
1) Check of operation of protection relay
   (1) Confirm that the relay turns ON approximately 5 seconds after the power switch is turned ON.
   (2) The SERVO indicator LED should light at the same time.
   (3) The relay should turn OFF approximately 0.5 seconds after the power switch is turned OFF.
2) Check of DC detection and servo circuitry operation
   (1) Turn the power on with no load.
   (2) After the speaker relay turns ON, apply DC+200mV to the CD input terminals. Confirm that the relay turns OFF.
   (3) Confirm that operation is the same as (2) above when an input of DC−200mV is applied.

Note) Under no circumstances connect a load or short the speaker terminals when performing the above test.

3) Signal input from the circuit illustrated below with no load.
   (1) Confirm that the speaker relay does not turn OFF even when a 2 ohm load is connected when a peak value of 30Vp is output.
   (2) Next, confirm that when a 1 ohm load is connected the speaker relay switchse OFF and ON a couple of times and then stays OFF.

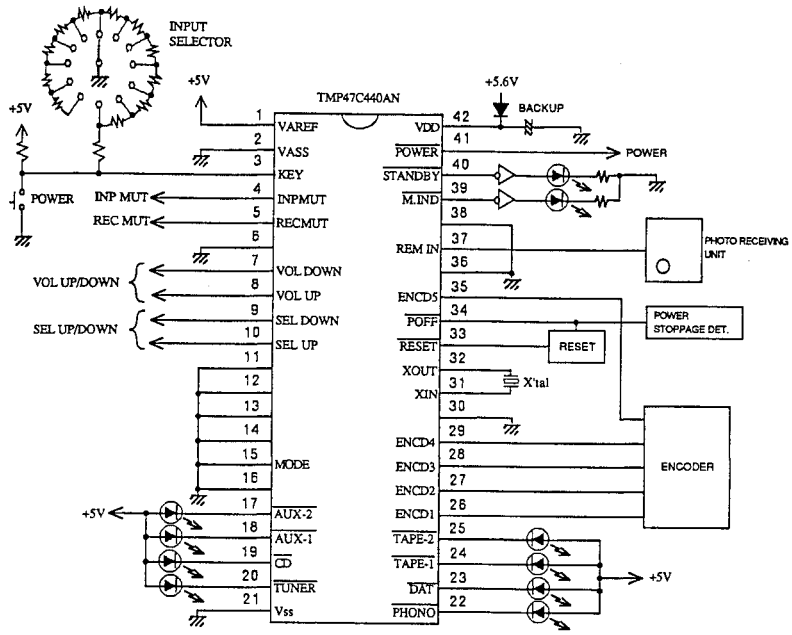
Note) The period before that relay stays OFF should not last for more than 1 minute.
Relay OFF status can be canceled by switching the power OFF.





IC BLOCK DIAGRAM

TMP47C440AN (Microprocessor)

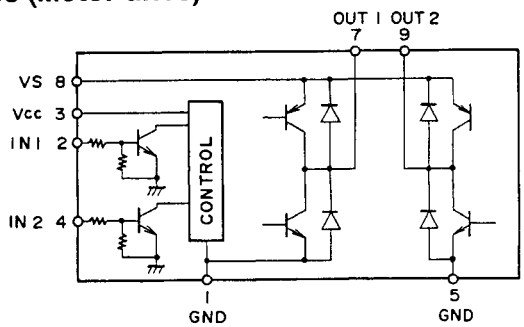


Pin No.	Symbol	Description
1	VAREF	Analog reference voltage for A/D conversion
2	VASS	Analog reference GND for A/D conversion
3	KEY	Input Selector, Power key input terminal. To read Input Selector and Power key by means of A/D conversion
4	INPUT	Muting output terminal for Main amplifier input. Active "H"
5	RECMUT	Muting output terminal for Rec. output. Active "H" To be output when switching Input Selector. To be output continuously in case of Input Selector TAPE-1, TAPE-2, DAT, and DIGITAL-4.
6	PLAYER	Control output terminal for PLAYER. "L" will be output for 200ms if input K64 code for remote control and set Input Selector for PHONO.
7	VOL DOWN	UP/DOWN output terminal for volume. Active "H" In case of UP (DOWN), VOL UP outpout will be "H" ("L"), while VOL DOWN output will be "L" ("H"). When not moving, both outputs shall be "H" (Brake).
8	VOL UP	
9	SEL DOWN	UP/DOWN output terminal for Input Selector. Active "H" In case of UP (DOWN), SEL UP output will be "H" ("L"), While SEL DOWN output will be "L" ("H"). When not moving, both outputs shall be "H" (Brake).
10	SEL UP	
11	S1	Output terminal for switching digital signal. Switch as follows through the position of Input Selector.
12	S2	
13	S3	
14	EXP/JPN	Input terminal for remote control initialization when energizing.

Input selector	Output S3	Output S2	Output S1
DIGITAL-1	L	L	L
DIGITAL-2	L	L	H
DIGITAL-3	L	H	L
DIGITAL-4	L	H	H
Others (Analog)	H	H	H

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>15</td><td>DIG-4/MODE</td><td rowspan="6">Output terminal for Input Selector display. Output of the position currently selected will be “L” (lighted).
DIG-4/MODE output will be input terminal MODE for initializtion of operation switch when energizing.
Outtput DIG-1/AUX-1, DIG-2/AUX-2 will be switched by initializing MODE into;
<table><tr><td>MODE</td><td>DIG-1/AUX-1</td><td>DIG-2/AUX-2</td></tr><tr><td>L (0)</td><td>AUX-1</td><td>AUX-2</td></tr><tr><td>H (1)</td><td>DIG-1</td><td>DIG-2</td></tr></table></td></tr>
<tr><td>16</td><td>DIG-3</td></tr>
<tr><td>17</td><td>DIG-2/AUX-2</td></tr>
<tr><td>18</td><td>DIG-1/AUX-1</td></tr>
<tr><td>19</td><td>CD</td></tr>
<tr><td>20</td><td>TUNER</td></tr>
<tr><td>21</td><td>VSS</td><td>GND terminal</td></tr>
<tr><td>22</td><td>PHONO</td><td rowspan="4">Output terminal for Input Selector display.
The output of the positon currently selected will be “L (lighted).</td></tr>
<tr><td>23</td><td>DAT</td></tr>
<tr><td>24</td><td>TAPE-1</td></tr>
<tr><td>25</td><td>TAPE-2</td></tr>
<tr><td>26</td><td>ENCD1</td><td rowspan="4">Input terminal for detecting position of rotary sw of input Selector.
To be connected with Encoder output for position detecting of Rotary sw.</td></tr>
<tr><td>27</td><td>ENCD2</td></tr>
<tr><td>28</td><td>ENCD3</td></tr>
<tr><td>29</td><td>ENCD4</td></tr>
<tr><td>30</td><td>TEST</td><td>To be connected with GND.</td></tr>
<tr><td>31</td><td>XIN</td><td rowspan="2">Terminal for connecting with ceramic oscillator (4 MHz)</td></tr>
<tr><td>32</td><td>XOUT</td></tr>
<tr><td>33</td><td>RESET</td><td>Input terminal for reset signal. Active “L”</td></tr>
<tr><td>34</td><td>POFF</td><td>Input terminal for detecting power suspension.
Take a countermeasure as soon as possible against power failure when turned into “L”. Set at HOLD mode.</td></tr>
<tr><td>35</td><td>ENCD5</td><td>Input terminal for detecting Rotary sw position of Input Selector.
To be connected with Encoder output for position detecting of Rotary sw.</td></tr>
<tr><td>36</td><td>SYS OUT/SYS EN</td><td>Ouptut terminal for System code. Active “L” to be turned into SYS EN for initialization input when energizing.</td></tr>
<tr><td>37</td><td>REM IN</td><td>Input terminal for remote control signal. Active “L”
To be connected with output of photoreceivin unit.</td></tr>
<tr><td>38</td><td>SYS IN</td><td>Input terminal for System code. Active “H”.</td></tr>
<tr><td>39</td><td>M. IND</td><td>Output terminal for Muting display. Lighted in case of “L”
To be set “L” when Muting of remote control is ON.</td></tr>
<tr><td>40</td><td>STANBY</td><td>Output terminal for Standby display. Lighted incase of “L”
To be turned into “L” when Power is OFF.
Except the case of power susupension, the level inverted of Power output is always output.</td></tr>
<tr><td>41</td><td>POWER</td><td>Output terminal for Power control. “L” When Power is ON</td></tr>
<tr><td>42</td><td>VDD</td><td>Power (+5V) Conntecting terminal.</td></tr>
</table>

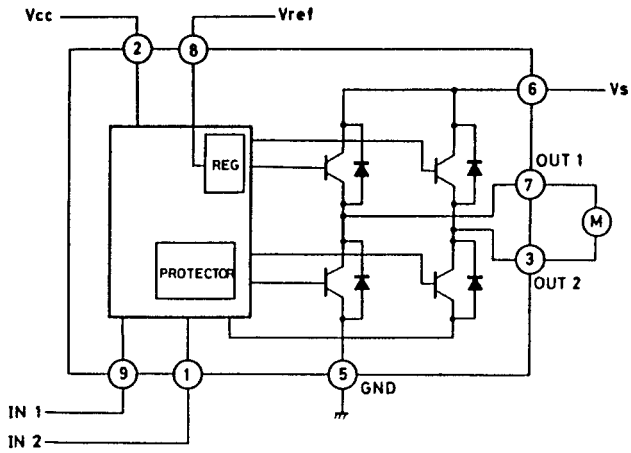
LB1638 (Motor drive)



Tauth Table

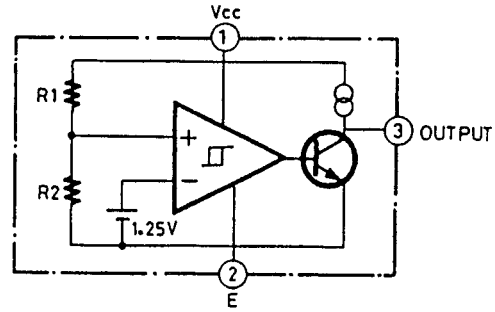
IN 1	IN 2	OUT 1	OUT 2	モード
H	L	H	L	NORMAL
L	H	L	H	REVERSE
H	H	L	L	BRAKE
L	L	OFF	OFF	WAIT

TA7291S (Motor drive)

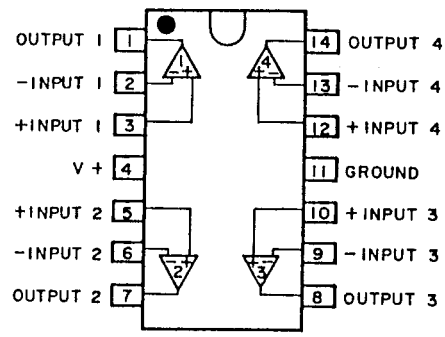


INPUT		OUTPUT		MODE
IN 1	IN 2	OUT 1	OUT 2	
0	0	∞	∞	STOP
1	0	H	L	CW/CCW
0	1	L	H	CCW/CW
1	1	L	L	BRAKE

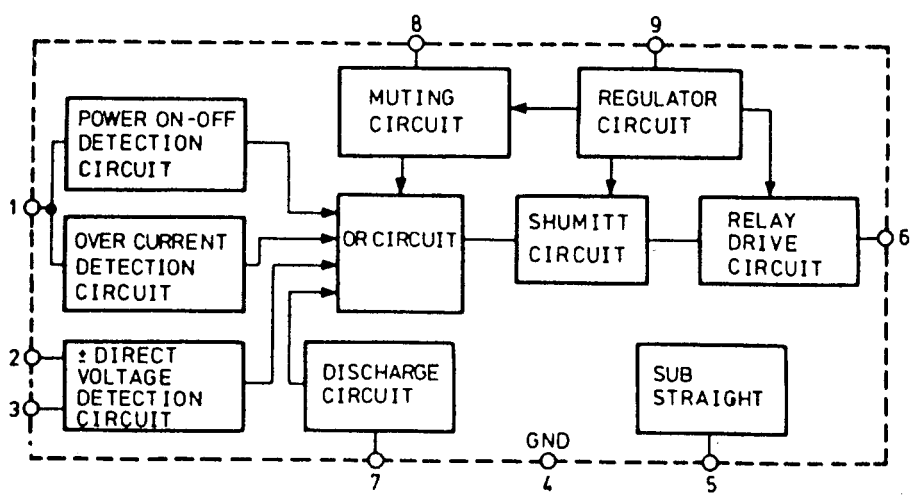
M51943BSL (System reset)



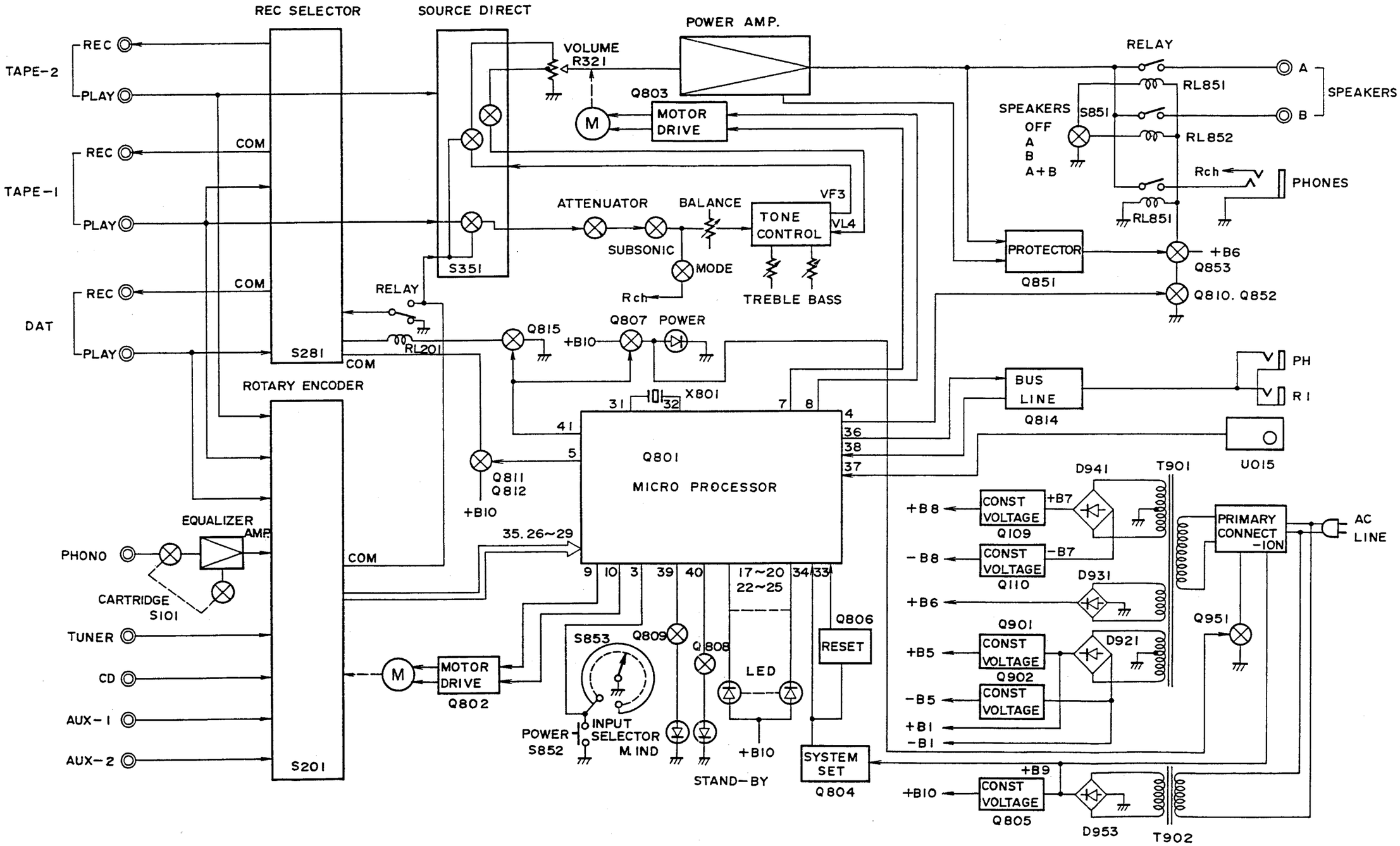
NJM2902N (OP Amp)



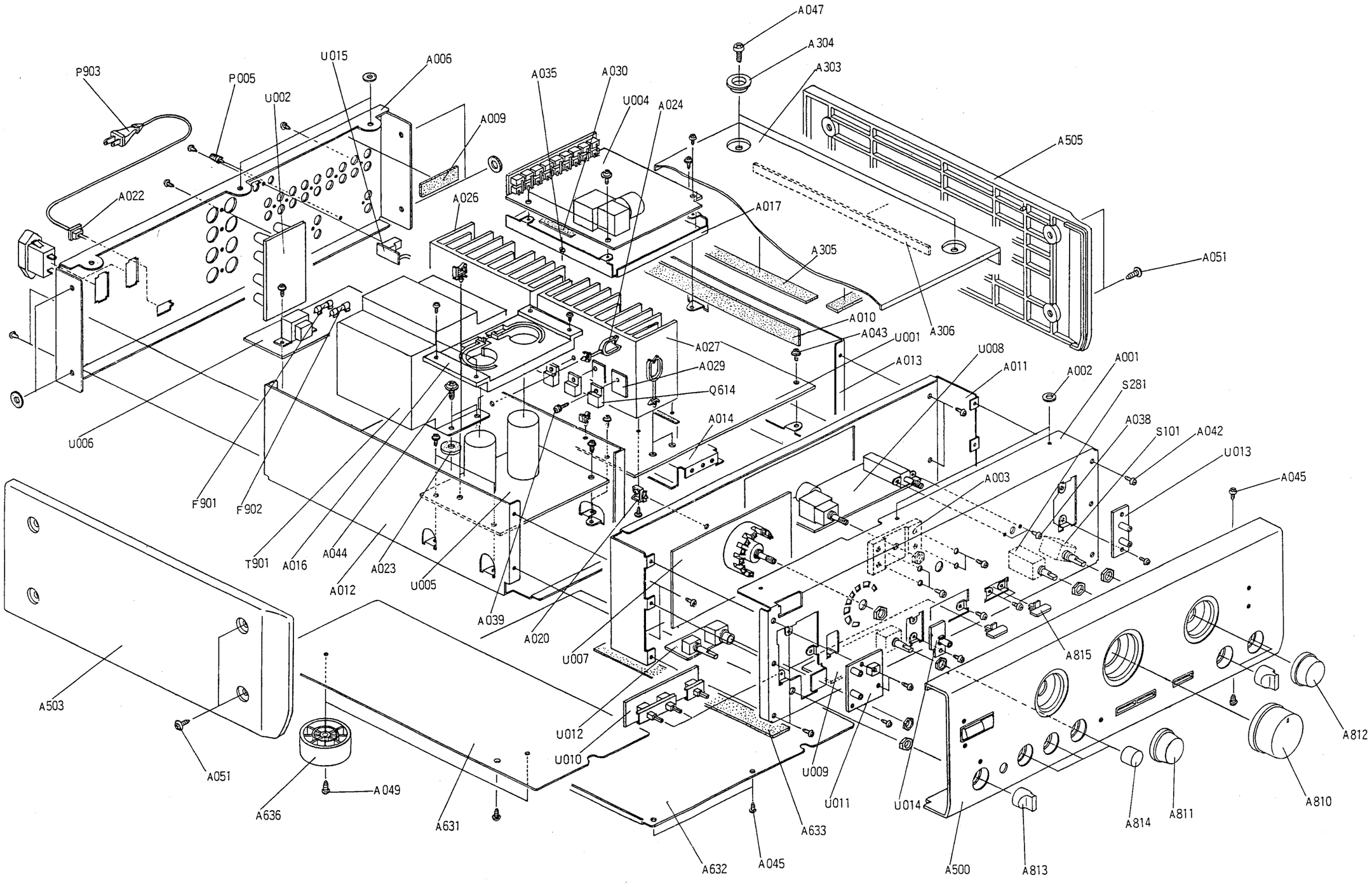
TA7317P (Protective circuit)



BLOCK DIAGRAM



CHASSIS-EXPLODED VIEW



CHASSIS EXPLODED VIEW PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A001	27110588-1C	FRONT BRACKET
A002	27270212	SPACER
A003	27270326A	SPACER (VOL)
A006	27121479A	BACK PANEL
A009	28140859	60×20×1.5T, CUSHION
A010	28140695	25×240×1.5T, CUSHION
A011	27130622A	BRACKET (SHIELD)
A012	27130623	BRACKET (L)
A013	27130624	BRACKET (R)
A014	27130656A	BRACKET (C)
A015	28170025	BUSHING
A016	27190846	HOLDER (CAPACITOR)
A017	27130627	BRACKET (EQ)
A020	27300833	WS-2NS, CRAMP
A022	27300750	#2271, BUSHING (AC CORD)
A023	27270213	SPACER (PT)
A024	27301394	HL-18-0, CRAMP
A026	27160282	RADIATION
A027	27160283	RADIATION
A029	27301328	BFG-20, RADIATION SHEET
A030	28140808	50×50×3T, CUSHION
A035	800529	BUSHING (PC)
A038	82143006	3P+6FN(BC), PAN-HEAD SCREW
A039	801433	3SMS8WSW+14B(BC), SPECIAL TAP-TIGHT SCREW
A042	834430088	3TTS+8B(BC), TAP-TIGHT SCREW
A043	831130088	3TTW+8B, TAP-TIGHT SCREW
A044	830440109	4TTC+10C(BC), TAP-TIGHT SCREW
A045	801230	3STS+8BQ(BC), TAP-TIGHT SCREW
A047	838440089	4TTB+8C(BC), TAP-TIGHT SCREW
A049	831430088	3TTW+8B(BC), TAP-TIGHT SCREW
A051	837440169	4TTT+16C(BC), TAP-TIGHT SCREW
A303	28184464	TOP COVER
A304	27265155A	COSMETIC RING (COVER)
A305	28140695	25×240×1.5T, CUSHION
A306	28140693	10×185×1.5T, CUSHION
A307	28141009	125×195×1.5T, CUSHION
A500	1A295121	FRONT PANEL ASS'Y [BLK]
(A511)	27265219	COSMETIC RING (L) [BLK]
(A512)	27265224A	COSMETIC RING ASS'Y (SEL) [BLK]
(A516)	28198742	FACET
(A518)	27265223	COSMETIC RING (D) [BLK]
(A519)	27265220C	COSMETIC RING (R) [BLK]
(A520)	28198742	FACET
(A523)	27265221A	COSMETIC RING (VOL) [BLK]
(A524)	28135199	NAME PLATE
(A801)	28324082A	KNOB ASS'Y (POW) [BLK]
(A805)	28191568	CLEAR PLATE (RE)
(A806)	28198753	FACET
(A807)	28198742	FACET
A808	28199190	FILM
A500	1A296121	FRONT PANEL ASS'Y [SIL]
(A511)	27265219-2	COSMETIC RING (L) [SIL]
(A512)	27265224-3A	COSMETIC RING ASS'Y (SEL) [SIL]
(A518)	27265223-3	COSMETIC RING (D) [SIL]
(A519)	27265220-2A	COSMETIC RING (R) [SIL]
(A523)	27265221-1	COSMETIC RING (VOL) [SIL]
(A801)	28324414	KNOB ASS'Y (POW) [SIL]
A503	28185359	SIDE BOARD (L)
A505	28185360	SIDE BOARD (R)
A631	27170271	BOTTOM BOARD (L)
A632	27170272A	BOTTOM BOARD (R)
A633	28141024	20×240×2.5T, CUSHION
A634	27270212	SPACER
A636	27175251	LEG ASS'Y
A810	28324083A	KNOB (VOL) [BLK]
A810	28324413A	KNOB (VOL) [SIL]
A811	28324084A	KNOB (SEL) [BLK]
A811	28324084-2	KNOB (SEL) [SIL]
A812	28324085B	KNOB (D) [BLK]
A812	28324085-2	KNOB (D) [SIL]
A813	28324086	KNOB (SP) [BLK]
A813	28324416	KNOB (SP) [SIL]
A814	28324411	KNOB (TONE) [BLK]
A814	28324412	KNOB (TONE) [SIL]
A815	28324088A	KNOB (PUSH) [BLK]
A815	28324417	KNOB (PUSH) [SIL]
Q609, Q613	2201703	2SC3855-O OR
Q614, Q610	2201706	2SC3855-P OR
	2201704	2SC3855-Y, TRANSISTOR
Q611, Q615	2201693	2SA1491-O OR
Q616, Q612	2201696	2SA1491-P OR
	2201694	2SA1491-Y, TRANSISTOR
⚠ T901	2300707	NPT-1116P, POWER TRANSFORMER [P]
S101	25030348	NRSF-102-20BU, SWITCH OPERATION SECTION
S281	25030349	NRSF-104-20BU, SWITCH OPERATION SECTION
P005	25060044	TERMINAL (GROUND)
⚠ P901, P902	25050337	NSCT-2P164, AC SOCKET
⚠ P903	253148 OR	AS-CEE OR
	253150	AS-CEE, POWER SUPPLY CABLE
⚠ F901	252075	2.5A-SE-EAK, FUSE
⚠ F902	252077	4A-SE-EAK, FUSE
U001	1A295509-1A	NAAF-4209-1A, MAINCIRCUIT PC BOARD ASS'Y
U002	1A295510-1A	NAETC-4210-1A, SPEAKER TERMINAL PC BOARDASS'Y
U004	1A295512-1A	NASW-4212-1A, INPUT CIRCUIT PC BOARD ASS'Y
U005	1A293513-1	NAPS-4213-1, POWER SUPPLY CIRCUIT (1) PC BOARD ASS'Y
U006	1A295514-1D	NAETC-4214-1D, POWER SUPPLY CIRCUIT (2) PC BOARD ASS'Y
U007	1A293515-1A	NADG-4215-1A, MICROPROCESSOR CIRCUIT PC BOARD ASS'Y
U008	1A293516-1	NAAF-4216-1, VOLUME & DIRECT SWITCH CIRCUIT PC BOARD ASS'Y
U009	1A293518-1	NAAF-4218-1, MUTING/SUBSONIC SWITCH PC BOARD ASS'Y
U010	1A293519-1	NASW-4219-1, TONE CONTROL CIRCUIT PC BOARD ASS'Y
U011	1A293520-1	NADIS-4220-1, PHOTORECEIVING CIRCUIT PC BOARD ASS'Y
U012	1A293521-1	NASW-4221-1, SPEAKER SWITCH CIRCUIT PC BOARD ASS'Y
U013	1A293522-1	NADIS-4222-1, LED PCBOARD ASS'Y
U014	1A293523-1	NADIS-4223-1, LED PCBOARD ASS'Y

REF.NO.	PART NO.	DESCRIPTION
U015	1A293524-1A	NAETC-4224-1A, REMOTE CONTROL TERMINAL PC BOARD ASS'Y
U016	1A295525-1A	NAETC-4225-1A, TUNER TERMINAL PC BOARD ASS'Y

NOTE: [BLK]: ONLY BLACK MODEL
[SIL]: ONLY SILVER MODEL

NOTE:
THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD PARTS LIST

MAIN CIRCUIT PC BOARD (NAAF-4209-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q105, Q106	222902	NJM5532D-D
Q109	222780205MIT	M5F78M20L
Q110	222790205MIT	M5F79M20L
Q519, Q520	222570	NJM4560D-X
Q585	22240040	NJM2902N
Q586	226007	TLP-531
Q851	222584	TA7317P
	Transistors	
Q101, Q102	2211535 OR	2SK146-GR OR
	2211536 OR	2SK146-BL OR
	2211537	2SK146-V
Q107, Q108	2211255	2SC1815-GR
Q501, Q502	2212805 OR	2SK389-GR OR
	2212806 OR	2SK389-BL OR
	2212807	2SK389-V
Q503~Q506	2211733 OR	2SC1845-E OR
	2211732	2SC1845-F
Q507, Q508	2213666 OR	2SA1240-F OR
	2213667	2SA1240-G
Q511, Q512	2211455 OR	2SA1015-GR OR
	2211454	2SA1015-Y
Q513, Q514	2211354 OR	2SA949-Y OR
	2211353	2SA949-O
Q517, Q518	2211255 OR	2SC1815-GR OR
	2211256	2SC1815-BL
Q581~Q584	2211634 OR	2SC2229-Y OR
Q589, Q601	2211633	2SC2229-O
Q602		
Q603, Q604	2211354 OR	2SA949-Y OR
	2211353	2SA949-O
Q605, Q606	2202034 OR	2SD1763A-D OR
	2202035	2SD1763A-E
Q607, Q608	2202024 OR	2SB1186A-D OR
	2202025	2SB1186A-E
Q617, Q618	2211634 OR	2SC2229-Y OR
	2211633	2SC2229-O
Q619, Q620	2211793 OR	2SA992-E OR
	2211792	2SA992-F
Q852	2212600	DTA124ES
Q853	2211504	2SA950-Y
Q901	2201512 OR	2SD1200-Q OR
	2201513	2SD1200-R
Q902	2201502 OR	2SB889-Q OR
	2201503	2SB889-R
Q903, Q904	2211945	2SK246-GR
Q905	2211255	2SC1815-GR
Q906	2211455	2SA1015-GR
	Diodes	
D101~D104	225251	TLR112, LED
D505, Q506		
D511~D516	223163	1SS133
D517~D520	225251	TLR112, LED
D851, D852	223163	1SS133
D853	224450623	MTZ6.2C, Zener
D854	223163	1SS133
D901~D903	224450562	MTZ5.6B, Zener
	Coils	
L101, L102	231133	NCH1188
L601, L602	231134	S-0.8E
L201~L203	230905	BL02RN1-R62
	Capacitors	
C103, C104	373631024	1000 pF, 100V, Film (KP)
C105, C106	373631514	150 pF, 100V, Film (KP)
C107, C108	372121014	100 pF, 50V, Styrene
C109, C110	391222217	220 μF, 6.3V, Elect.(MUSE)
C111, C112	372122024	2000 pF, 50V, Styrene
C113~C116	379122434	0.024 μF, 50V, Film (DEW)
C117, C118	374724334	0.043 μF, 50V, Film (TF)
C119~C122	391651017	100 μF, 25V, Elect.(FS)
C123, C124	373632224	2200 pF, 100V, Film (KP)
C147, C148	354764719	470 μF, 35V, Elect.
C149, C150	354741019	100 μF, 16V, Elect.
C151, C152	354761019	100 μF, 35V, Elect.
C153, C154	391254717	470 μF, 25V, Elect.(MUSE)
C155, C156		
C157, C158	354761019	100 μF, 35V, Elect.
C159, C160	373732234	0.022 μF, 100V, Film (MKT)
C501, C502	373631014	100pF, 100V, Film (KP)
C509, C510		

CIRCUIT NO.	PART NO.	DESCRIPTION
C511, C512	372123304	33 pF, 50V, Styrene
C513~C516	391252207	22 μF, 25V, Elect.(MUSE)
C517, C518	372123304	33 pF, 50V, Styrene
C519, C520	354722219	220 μF, 6.3V, Elect.
C521, C522	374791044	0.1 μF, 63V, Film (TF)
C523, C524	391242217	220 μF, 16V, Elect.(MUSE)
C525~C526	373732234	0.022 μF, 100V, Film (MKT)
C527, C528	373734734	0.047 μF, 100V, Film (MKT)
C529, C530	354790479	4.7 μF, 100V, Elect.
C581	391221027	1000μF, 6.3V, Elect.(MUSE)
C582	354721019	100 μF, 6.3V, Elect.
C583	354764709	47 μF, 35V, Elect.
C605, C606	391241017	100 μF, 16V, Elect.(MUSE)
C607, C608	373791044	0.1 μF, 63V, Film (MKT)
C609, C610	374794734	0.047 μF, 63V, Film (TF)
C611, C612	374722235	0.022 μF, 50V, Film (TF)
C613, C614	379121035	0.01 μF, 50V, Film (DEW)
C615~C622	373791044	0.1 μF, 63V, Film (MKT)
C851	354722219	220 μF, 6.3V, Elect.
C852	354742209	22 μF, 16V, Elect.
C853	354784799	0.47 μF, 50V, Elect.
C855	354743319	330 μF, 16V, Elect.
C858, C859	374721044	0.1 μF, 50V, Film (TF)
C901~C903	354774719	470 μF, 63V, Elect.
C905, C906		
C909, C910	354761009	10 μF, 35V, Elect.
C911, C912	354724719	470 μF, 6.3V, Elect.
C913, C914	354751029	1000μF, 25V, Elect.
C915, C916	354754719	470 μF, 25V, Elect.
C917	391221027	1000μF, 6.3V, Elect.(MUSE)
C918	374724734	0.047 μF, 50V, Film (TF)
	Resistors	
R151, R152	442523304	33 Ω, 1/2W, Metal oxide film
R527, R528	441622734	27 kΩ, 1W, Metal oxide film
R535, R536	5210062	N06HR4.7KBD, Semi-fixed
R601, R602	442522224	2.2 kΩ, 1/2W, Metal oxide film
R603, R604	442522214	220 Ω, 1/2W, Metal oxide film
R607~R614	442520224	2.2 Ω, 1/2W, Metal oxide film
R615~R618	4000078	0.33 Ω, 5W, Metal plate
R623~R626		
R633, R634	442820824	8.2 Ω, 3W, Metal oxide film
R862	442525114	510 Ω, 1/2W, Metal oxide film
R875, R876	441623914	390 Ω, 1W, Metal oxide film
R901~R903	441620684	6.8 Ω, 1W, Metal oxide film
R905, R906	442524314	430 Ω, 1/2W, Metal oxide film
	Switch	
S101	25065439	NSS-62159, Slide switch
	Relaies	
RL851, RL852	25065316	NRL-2P7A-DC12-043
	Plug	
P104	25055100	NPLG-3P84
P256	25055133	NPLG-3P117
P321	25055137	NPLG-7P121
P852	25055139	NPLG-9P123
	Terminal	
P101	25045341	NPJ-2PDBL-192
	Socket ass'y	
P103	2009990200	NSAS-06P0282
P752	2009990003	NSAS-06P0007
P753	2009990004	NSAS-06P0008
	Jumper sockets	
JL211, JL213	25050268	NSCT-4P96
JL212, JL951	25050267	NSCT-3P95
	Bracket	
	27141059	(Ground)
	27301427	(Bus)
	Cushion	
	28140963	
	Holder clamp	
	27301186	MSA-1606
	27301271	MSA-1609

SPEAKER TERMINAL PC BOARD (NAETC-4210-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Terminals	
P751, P752	25060162	NTM-4PDMN088

INPUT CIRCUIT PC BOARD (NASW-4212-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diode	
D201	223163	1SS133
	Capacitor	
C201	374721034	0.01μF, 50V, Film (TF)
	Switches	
S201	25030330	NRS-2211-BA, Rotary
S281	25065438	NSS-84158, Slide
	Relay	
RL201	25065397	NRL-2P1A-DC5-068
	Input terminals	
P201~P204	25045305	NPJ-4PDBL164
P207	25045304	NPJ-2PDBL163
	Plugs	
P205, P206	25055133	NPLG-3P117
P103A		
P211	25055139	NPLG-9P123
	Socket ass'y	
P256	2009990090	NSAS-6P0128
	Jumper socket	
JL201	25050267	NSCT-3P95

POWER SUPPLY CIRCUIT (1) PC BOARD (NAPS-4213-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D921	22380040	RBV-602L
D922, D923	22380012	HER303F
D931	22380039	1D4B42
D932	22380032	1SR139-100
D941	22380039	1D4B42
	Coils	
L921, L922	230906	BL02RN2-R62
	Capacitors	
C921, C922	3504246	18000 μF, 63V, Elect.
C923~C925	374503345	0.33 μF, 125V, Film (ME)
C931, C932	374722235	0.022 μF, 50V, Film (TF)
C933	354741029	1000 μF, 16V, Elect.
C934	354744719	470 μF, 16V, Elect.
C941, C942	354761029	1000μF, 35V, Elect.
C943, C944	374722235	0.022 μF, 50V, Film (TF)
C945	374501045	0.1 μF, 125V, Film (ME)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R931	442520104	1 Ω, 1/2W, Metal oxide film
R932	441623314	330 Ω, 1W, Metal oxide film
R941, R942	442522294	0.22 Ω, 1/2W, Metal oxide film
	Jumper socket	
JL941	25050267	NSCT-3P95
	Socket ass'y	
P104	2009990069	NSAS-6P0106
	Plug	
P951a	25055133	NPLG-3P117
	Bracket	
	27301367	(Bus)
	Radiator	
D921a	27160265	RAD-82

POWER SUPPLY CIRCUIT (2) PC BOARD (NAETC-4214-1D)

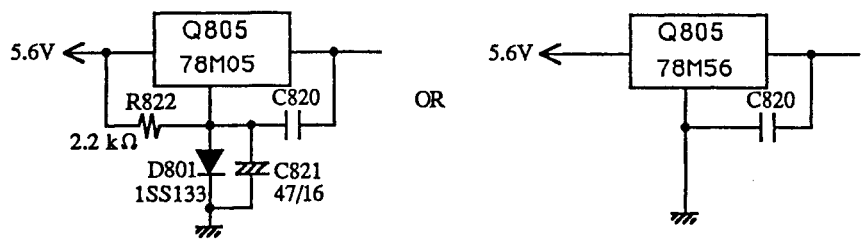
CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistor	
Q951	2213650	DTD113ZS
	Diodes	
D951	223163	1SS133
D952	22380039	1D4B42
	Transformer	
⚠ T902	2300711	NPT-1117P
	Capacitors	
C951~C955	374721034	0.01 μF, 50V, Film (TF)
C956	354752229	2200 μF, 25V, Elect.
⚠ C971	3500065A	0.01μF, AC400V/125V, Film (IS)
⚠ C972	3500065A	0.01μF, AC400V/125V, Film (IS)
	Condensor cover	
⚠ C972a, C973a	27301216	SB1925A
	Resistors	
R951	442520104	1 Ω, 1/2W, Metal oxide film
R952	441628214	820 Ω, 1W, Metal oxide film
	Relay	
⚠ RL901	25065248	NRL-1P15A-DC12-29
	Terminals	
	25060092	NTM-1S33
	Socket ass'y	
P951	2009990180	NSAS-6P0250
	Fuse holder	
⚠ F901a, F902a	25050065	YSH403T

CIRCUIT NO.	PART NO.	DESCRIPTION
	Fuse label	
⚠ F902b	29360374	T4A/250V

MICROPROCESSOR CIRCUIT PC BOARD (NADG-4215-1A)

CIRCUIT NO	PART NO.	DESCRIPTION
	ICs	
Q801	22240377	TMP47C440AN-1997
Q802	22240358	LB1638
Q803	22240239	TA7291S
Q804	222951	M51943BSL
Q805	222780055	78M05HF
✻ (Q805	222780565	78M56)
	Transistors	
Q806	2213160	DTC124ES
Q807~Q809	2213510	DTA114ES
Q810	2211255	2SC1815-GR
Q811	2213090	DTA114YS
Q812	2213650	DTD113ZS
Q813	2211164	2SC2120-Y
Q814	2213090	DTA114YS
Q815	2211504	2SA950-Y
	Diodes	
D801, D816	223163	1SS133
D803~D807		
D802	224450562	MTZ5.6B, Zener
D808~D815	225142DX2	SEL2913K-DX2, LED
D817	224450562	MTZ5.6B, Zener
	Coils	
L801	233409K220	NCH-1284
L802~L807	230906	BL02RN2-R62
	Osc, element	
X801	3010150	CST4.00M3W
	Capacitors	
C803, C807	354744709	47 μF, 16V, Elect.
C808	375524744	0.47 μF, 50V, Film (MMT)
C810	3000051	0.047 F, 5.5V, Super
C816	374721044	0.1 μF, 50V, Film (TF)
C819	354724719	470 μF, 6.3V, Elect.
C821	354744709	47 μF, 16V, Elect.
C822	354761009	10 μF, 35V, Elect.
C824	354744709	47 μF, 16V, Elect.
C827	353741009	10 μF, 16V, Elect.
C829, C830	374721035	0.01μF, 50V, Film (TF)
	Resistors	
R817, R818	49163103405	RM1/10IJ10K×5, Resistor network
R830	441620564	5.6 Ω, 1W, Metal oxide film
	Socket ass'y	
P211	2009990110	NSAS-18P0167
P801	2000871	NSAS-6P827

NOTE: ✻



CIRCUIT NO	PART NO.	DESCRIPTION
	Radiator	
Q805a	27160145	RAD-51
	Switch	
S853	25030334	NRS-112-25RSM
	Holder	
	27190786	(LED-8)

VOLUME & DIRECT SWITCH CIRCUIT PC BOARD (NAAF-4216-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistor	
R321	5104294	N27DGL50KT30, Variable
	Switch	
S351	25030336A	NRS-184-25SS, Rotary
	Socket ass'y	
P205	2000809	NSAS-6P765
P206	2000630	NSAS-6P586
P321	2009990179	NSAS-14P0249
	Jumper socket	
JL401A	25050267	NSCT-3P95

MUTING/SUBSONIC SWITCH PC BOARD (NAAF-4218-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C301~C304	374721635	0.016 μF, 50V, Film (TF)
C305, C306	374721825	1800 pF, 50V, Film (TF)
C307, C308	374728234	0.082 μF, 50V, Film (TF)
	Resistors	
R301	5148107A	N16RGMC250KMN25, Variable
R302	5142002	N16RGM11C100K25, Variable
R303	5144011	N16RGM11C70K88K25, Variable

TONE CONTROL CIRCUIT PC BOARD (NASW-4219-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C331, C332	374724744	0.47 μF, 50V, Film (TF)
	Switches	
S331 (S332)	25035601	NPS-222-L565
S333	25035584	NPS-122-L546

PHOTO RECEIVING CIRCUIT PC BOARD (NADIS-4220-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Photo receiving unit	
U015	24130003	GP1U50XS
	Diodes	
D831~D833	223163	1SS133
D834~D836	225142DX2	SEL2913K-DX2, LED
	Capacitor	
C831	354744709	47 μF, 16V, Elect.
	Switch	
S852	25035548	NRS-111-S510
	Holder	
	27190787	(LED-1)

SPEAKER SWITCH CIRCUIT PC BOARD (NASW-4221-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diode	
D855	223163	1SS133
	Switch	
S851	25030335	NRSF-124-20BU, Rotary
	Stereo jack	
P851	25045337	HLJ4317-01-3120
	Relay	
RL853	25065174	NRL-2P1A-DC12-09
	Socket ass'y	
P852	2009990185	NSAS-18P0255
	Shield plate	
	27150208	

LED PC BOARD (NADIS-4222-1)

CIRCUIT NO	PART NO.	DESCRIPTION
	Diodes	
D203, D204	225142DX2	SEL2913K-DX2, LED
	Jumper socket	
JL210	25050267	NSCT-3P95
	Holder	
	27190787	(LED-1)

LED PC BOARD (NADIS-4223-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diode	
D821	225142DX2	SEL2913K-DX2
	Holder	
	27190787	(LED-1)

REMOTE CONTROL TERMINAL PC BOARD (NAETC-4224-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Mini jack	
P251	25045172	HSJ1003-01-020
	Plug	
P801a	25055133	NPLG-3P117

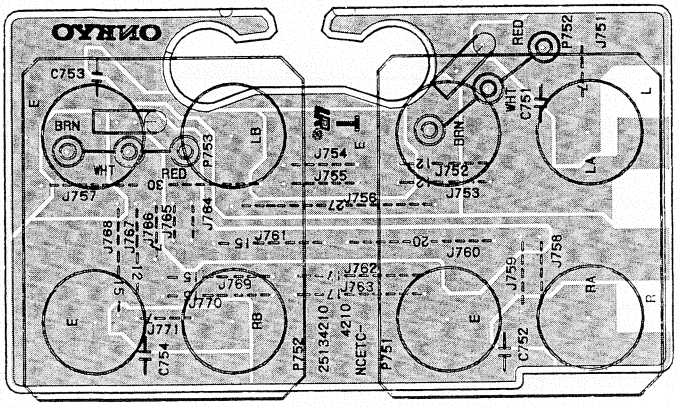
TUNER TERMINAL PC BOARD (NAETC-4225-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Terminal	
P221	25045307	NPJ-2PDBL166

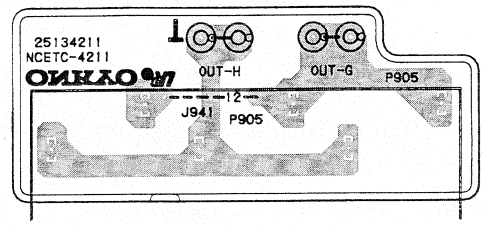
NOTE:
THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

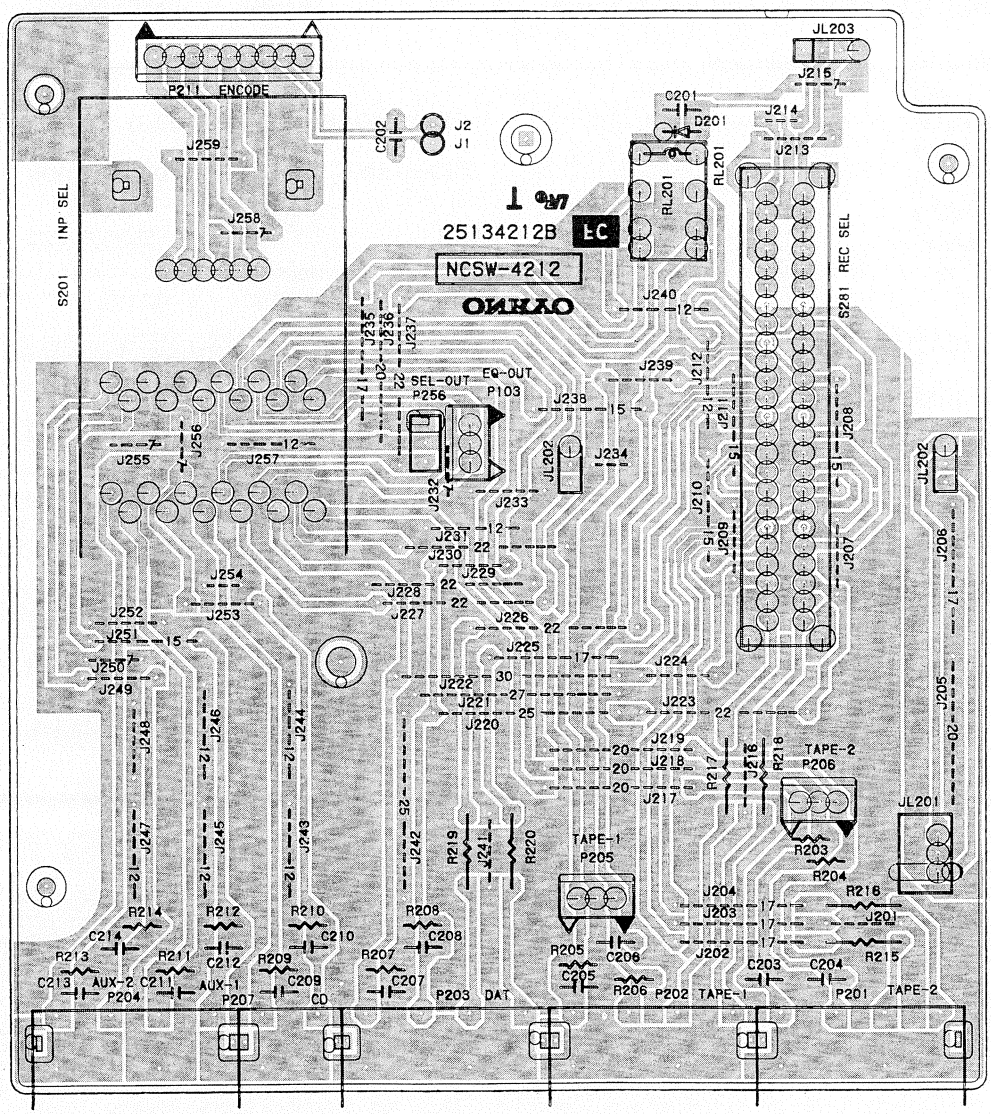
NAETC-4210



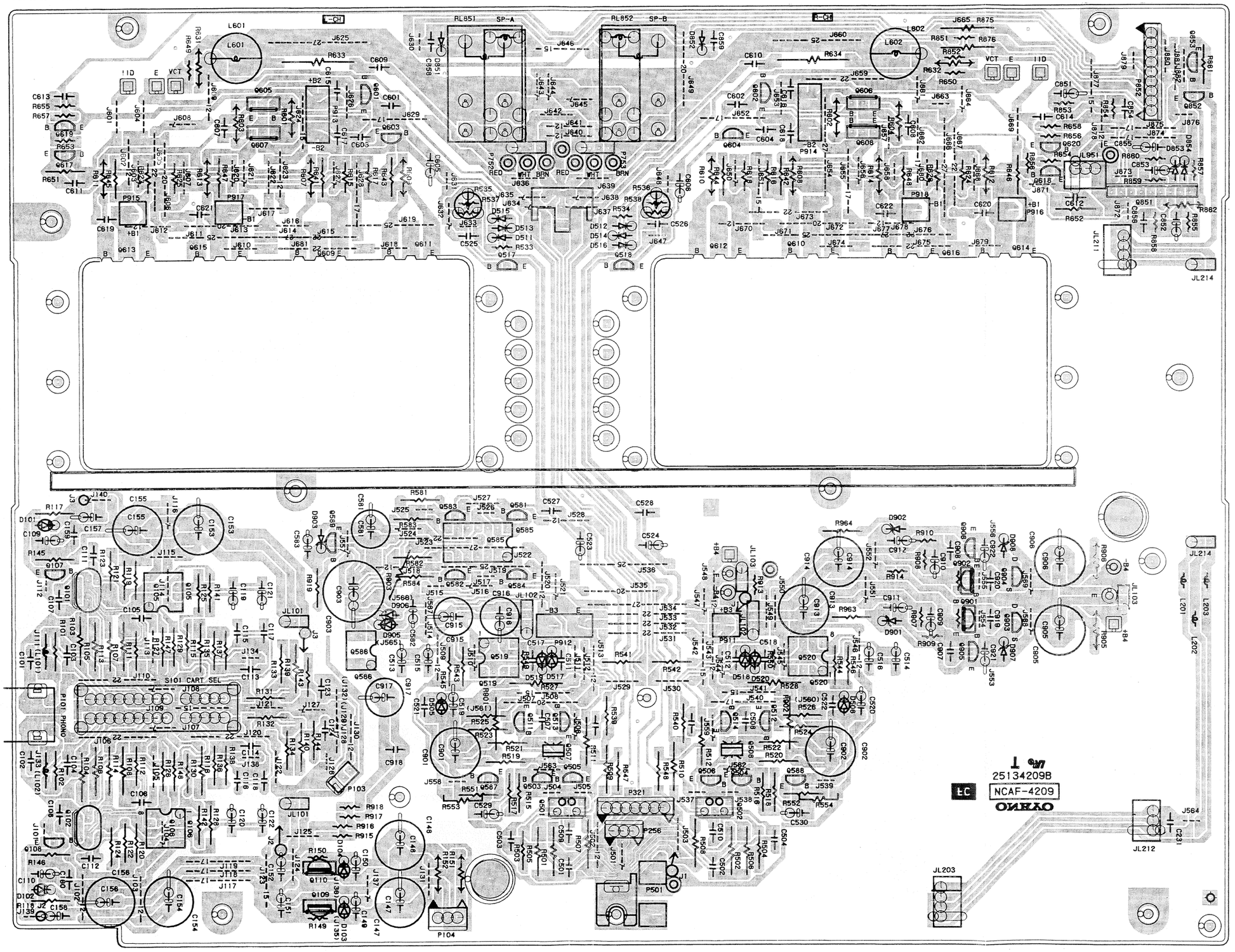
NAETC-4211



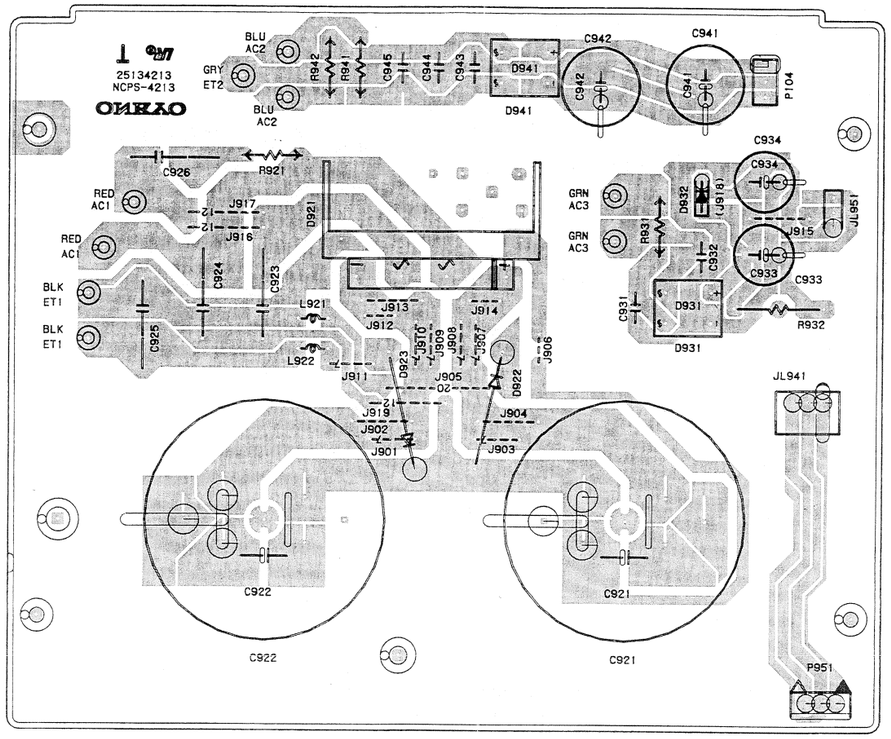
NASW-4212



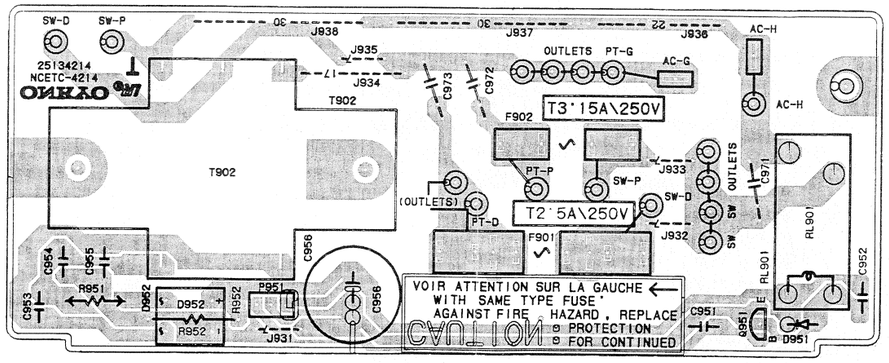
NAAF-4209


L-CH
R-CH
SP-A
SP-B
RL851
RL852
S101 CART SEL
P101 PHONO
P915
P916
P917
P918
P913
P914
P256
P321
P501
P103
P104
JL101
JL102
JL103
JL211
JL212
JL214
JL951
JL203
L601
L602
L101
L201
L202
L203
+B1
+B2
+B3
+B4
-B1
-B2
-B3
-B4
VCT
25134209B
NCAF-4209
ONKYO

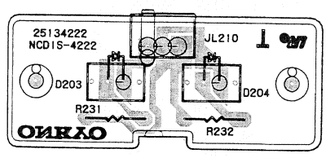
NAPS-4213



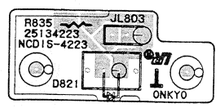
NAETC-4214



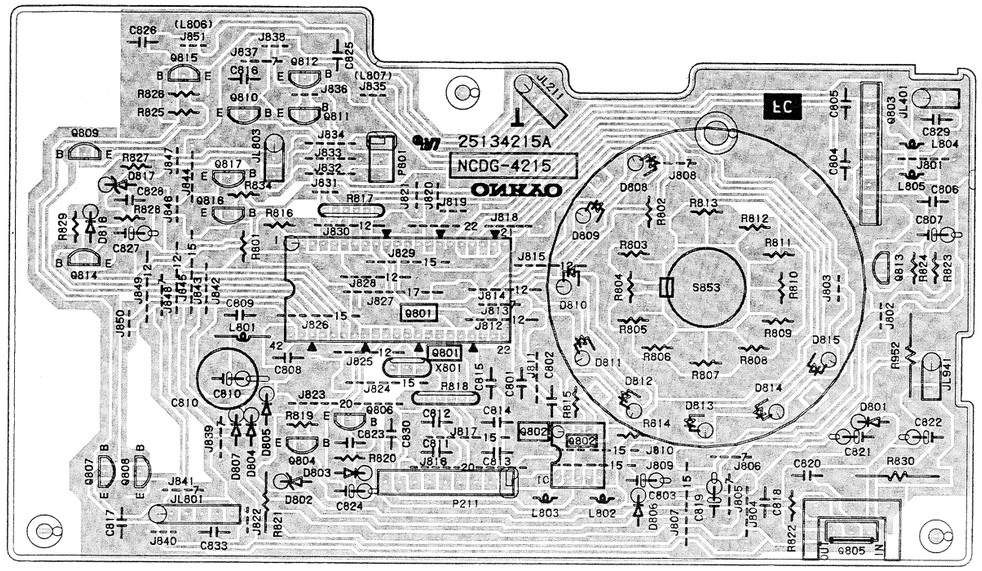
NADIS-4222



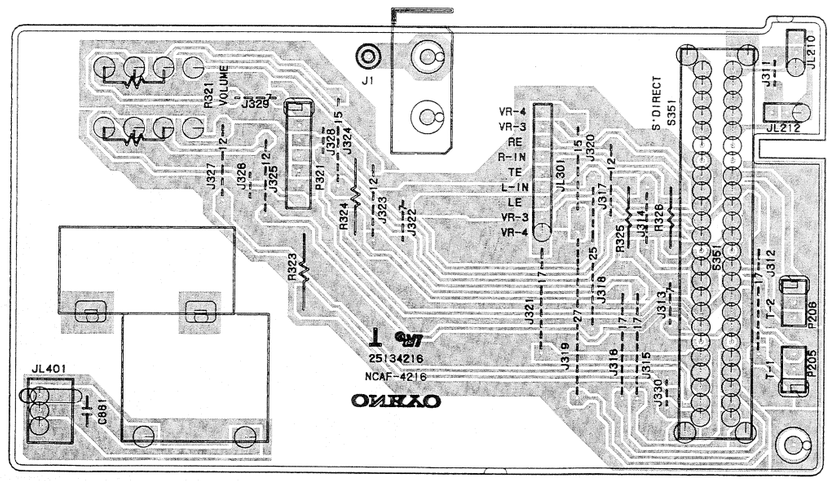
NADIS-4223



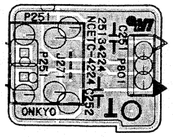
NADG-4215



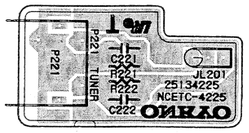
NAAF-4216



NAETC-4224

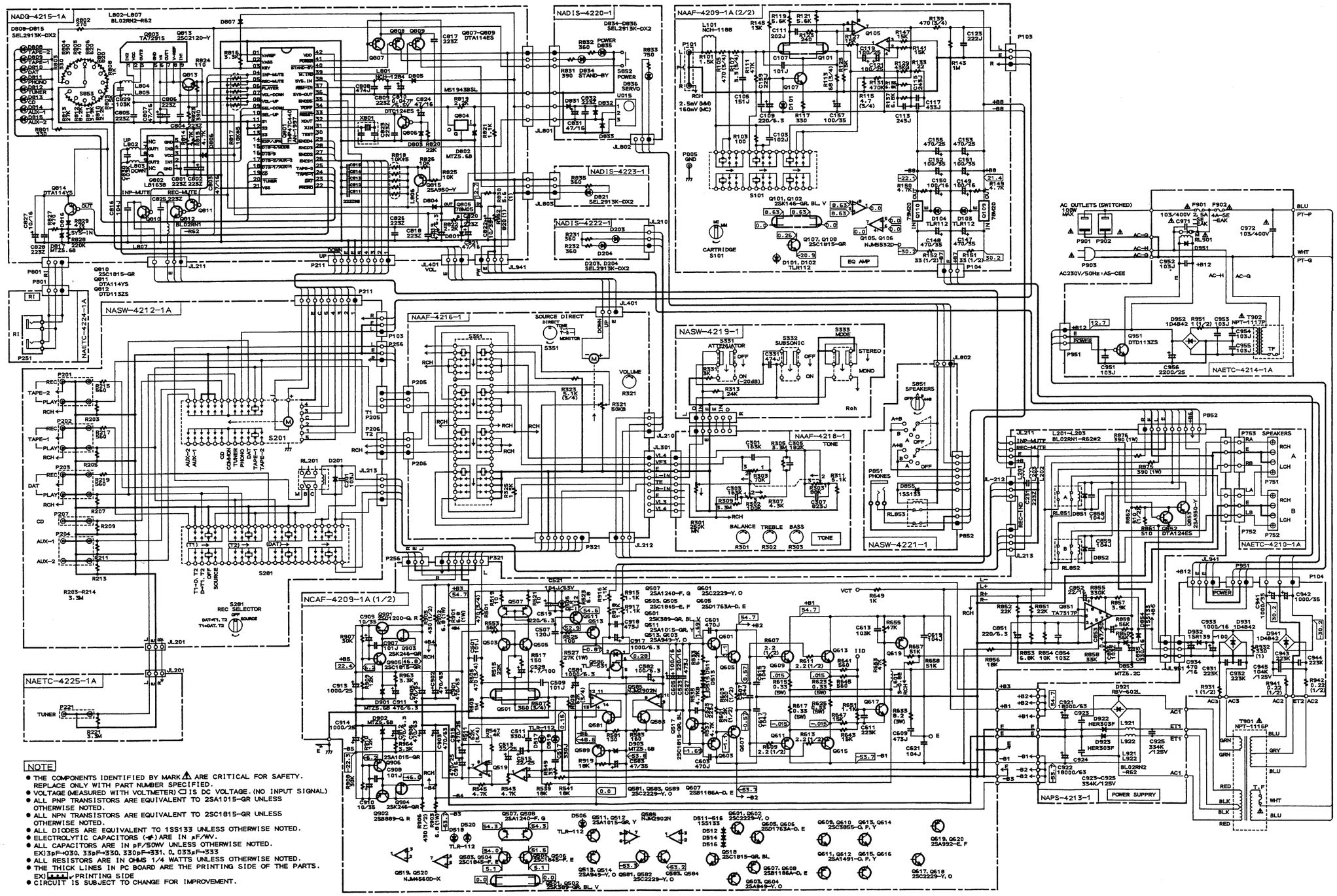


NAETC-4225



SCHEMATIC DIAGRAM

MODEL A-8870

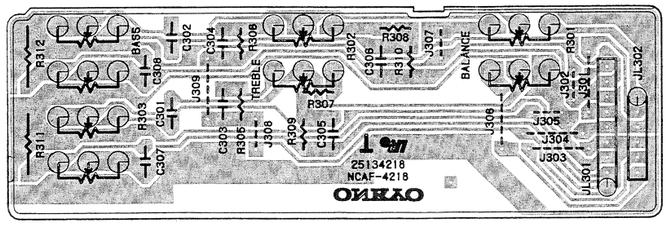


NOTE

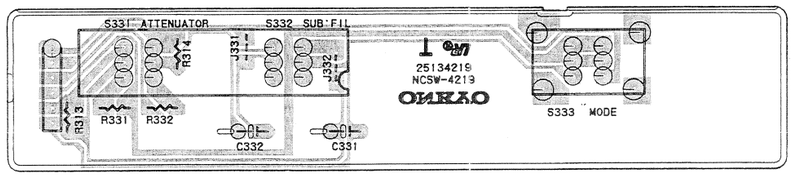
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH VOLTMETER) ⊐ IS DC VOLTAGE. (NO INPUT SIGNAL)
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (◆) ARE IN μF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. EX) 3pF→030, 33pF→330, 330pF→331, 0.033μF→333
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EX) ▬▬ PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

ONKYO CORPORATION

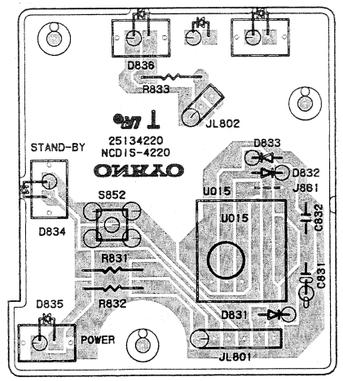
NAAF4218



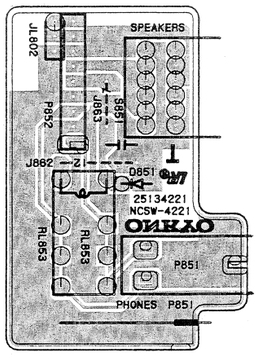
NASW-4219



NADIS-4220



NASW-4221



PARTS LIST OF PACKING

REF. NO.	PART NO.	DESCRIPTION
A851	29052259	MASTER CARTON BOX [BLK]
A851	29052261	MASTER CARTON BOX [SIL]
A852	29091425A	PAD, LEFT
A853	29091426A	PAD, RIGHT
A854	261504	PAPER TAPE
A855	29100035A	1020×720, POLY-VINYL BAG
A857	282320	SEALING HOOK
A858	29110071	DAMPLON TAPE (W=50)
	29355133A	DBP CAUTION LABEL
	ACCESSARY BAG	
A901	29341650	INSTRUCTION MANUAL
	29365020C	WARRANTYCARD
A903	24140207	RC-207S, REMOTE CONTROL TRANSMITTER
A904	3010054	UM-3, BATTERY
A905	2010200	3.5 mm, MINI PLUG ASS'Y
A906	29100097	350 × 250, POLY-VINYL BAG

NOTE [BLK]: ONLY BLACK MODEL
[SIL]: ONLY SILVER MODEL

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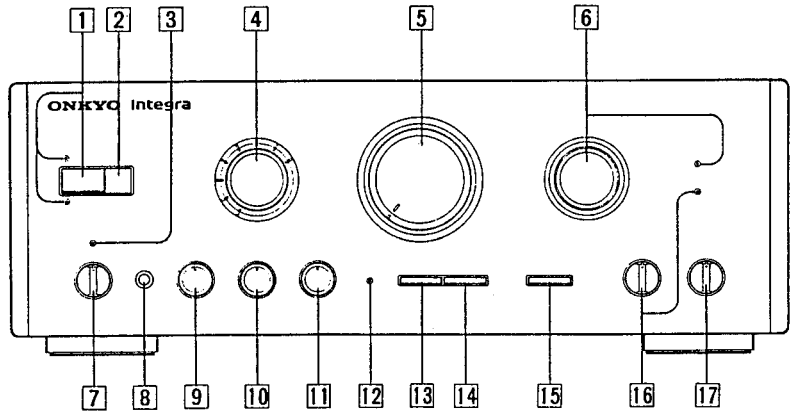
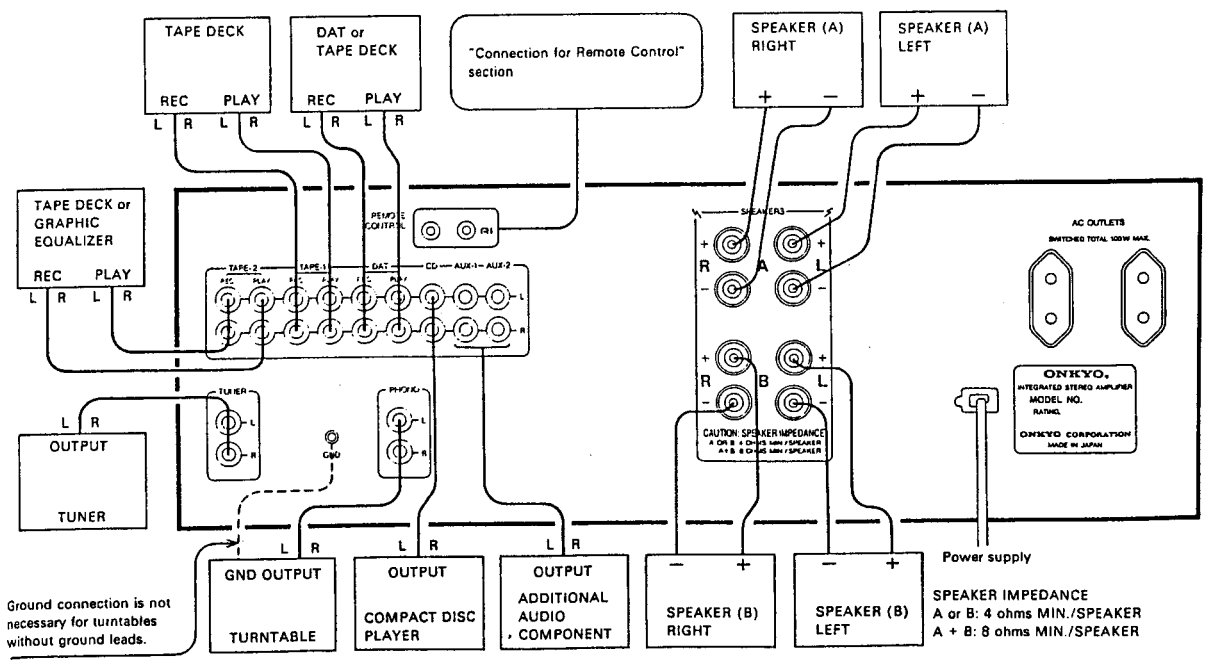
FRONT PANEL FACILITIES



1. Power switch (POWER)
2. Remote control sensor
3. Servo operation indicator (SERVO OPERATION)
4. Input selector switch (INPUT SELECTOR)
   TAPE-2, TAPE-1, DAT, PHONO, CD, AUX-1, AUX-2
5. Volume control (VOLUME)
6. Source direct switch (SOURCE DIRECT)
   DIRECT, TONE, MONITOR TAPE-1/TAPE-2
7. Speaker selector switch (SPEAKERS)
   OFF, A, B, A+B
8. Headphone jack (PHONES)
9. Bass control (BASS)
10. Treble control (TREBLE)
11. Balance control (BALANCE)
12. Muting indicator
13. Attenuator switch (ATTENUATOR)
14. Subsonic filter switch (SUBSONIC)
15. Mode selector switch (MODE)
    STEREO, MONO
16. Recording source selector switch (REC SELECTOR)
    TAPE-1→DAT & TAPE-2, DAT→TAPE-1 & 2
    OFF
    SOURCE
17. Cartridge selector switch (CARTRIDGE)
    MC, MM

SYSTEM CONNECTIONS



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